

Background and Goal

Traditionally, sevoflurane delivery was performed in high fresh gas flow (FGF), mainly owing to two reasons: 1-lack of precise monitoring of gas concentrations, and 2-ease of reliable administration. Being a recognised greenhouse gas with a considerable price tag, cutting down the waste of volatile anaesthetics promises important ecologic and economic benefits. Automated gas control (AGC) of the Flow-I ventilator (Maquet) permits easy and reliable administration of volatiles with minimal operator intervention, while significantly decreasing waste. Still, manual gas (MGC) with swift decrease of FGF may permit further waste reduction, albeit with significantly more manual interventions. The aim of the present study was to compare sevoflurane consumption in AGC versus low-flow MGC.

Materials and Methods

In this study, either AGC or MGC was used in 2x100 consecutive patients. All patients were anesthetized by the same clinician. Volatile administration was initiated after induction of anesthesia (with propofol), intubation and start of mechanical ventilation. In both groups 1 MAC was pursued: in the first group, AGC mode (speed 6) was used, in the second group using MGC, sevoflurane concentration in fresh gas was set at 8%, with high FGF for 3 ventilations, and

Subsequent adjusted to a minimal FGF of 0.3ml/min with ensuing single-breaths of high FGF if necessary.

Results and Discussion

Individual and Mean(SD) anesthesia time and sevoflurane consumption in both groups are shown in figure 1. Linear regression analysis shows a consumption of 0.141 ml/min in the AGC group and 0.095 ml/min in the MGC group. The simulated sevoflurane consumption with constant flow sevoflurane administration is 0.213ml/min in 2L FGF and 0.639ml/min in 6L FGF.

Conclusion

AGC significantly reduces the usage of agent compared to traditional constant FGF setting. Our results, however, clearly indicate that the current AGC-algorithms still have substantial room for improvement, since manual gas control with minimal flow anesthesia still results in a 33% lower consumption.

References

1. Biro P. Acta Anaesthesiol Scand. 2014;58:968-72.

